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Notice of Allowability**Application No.**

09/901,087

Examiner

Thomas R Artman

Applicant(s)

KURAMOTO, YOSHIYUKI

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 22 November 2004.
2. ☒ The allowed claim(s) is/are 1-42.
3. ☒ The drawings filed on 10 July 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Allowable Subject Matter

Claims 1-42 are allowed.

The following is an examiner's statement of reasons for allowance:

The prior art made of record teaches the general structure and practice of using a Fizeau interferometer for performing wavefront aberration, image state, distortion and curvature of field measurements at various points lying in a plane perpendicular to the optical axis of an image projection system under test. In particular, Suzuki (US 5,898,501) teaches such an interferometer that uses a computing unit in a method of calculating simulated wavefronts and determining the required correction profile for the test lens/objective based upon the measured wavefronts (see col.2, lines 22-35, and col.3, lines 4-52).

However, none of the references, alone or combined, teach or reasonably suggest the additional combination of a calculating unit, or method steps, that:

a) measure transmission wavefronts of an imaging optical system at a plurality of measurement points, and

b) calculate a wavefront aberration, imaging state, distortion, or curvature of field of the imaging optical system at each measurement point using the measured wavefront data and by using one of the measurement points as a standard, or reference, point as required by each of claims 1, 13, 14, 25-27, 29, 41 and 42.

Claims 2-12, 15-24 and 30-40 are allowed by virtue of their dependency.

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Furthermore, none of the references, alone or combined, teach or reasonably suggest the additional combination of a calculating unit, or method steps, that:

- a) measure transmission wavefronts of an imaging optical system with respect to at least one of a plurality of measurement points, and
- b) calculate an imaging state of the imaging optical system at one of the measurement points by using the measured wavefront data and the imaging state of another measurement point as required by the combination of claim 28.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kakuchi (US 6,614,535) and Murakami (US 2004/0036883) teach a similar Fizeau interferometer to that of Suzuki, but do not perform part b) in the above reasons for allowance. LaFleur (US 5,815,268) teaches a similar Fizeau arrangement where several data points are measured simultaneously. Stenton (US 6,480,284) teaches the practice of using calibration data for correcting measured image data. Kawasaki (US 6,473,186) teaches the practice of using a standard point as a reference point for repositioning portions of the interferometer system in

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order to measure multiple points sequentially; the reference point is not used in calculations as stated in part b) of the reasons for allowance above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (571) 272-2485. The examiner can normally be reached on 9am - 6:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas R. Artman
Patent Examiner



EDWARD J. GLICK
SUPERVISOR, PATENT EXAMINER